

# SCIENCE

## *And Technology Program*



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Program Area: Hydroelectric Infrastructure Protection  
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**Abstract:** High-voltage dc tests have traditionally been used to detect cracks and fissures, surface contamination, and moisture in rotating machine insulation systems. Not generally recognized, however, is the ability of dc testing to diagnose delaminated groundwall insulation. This impaired insulation condition is generally evaluated using ac tests, such as dissipation factor tip up and partial discharge measurements. In recent years, however, we have observed a distinctive nonlinear characteristic of the current versus ramped dc voltage test response which identifies rotating machines having delaminated stator winding insulation. The purpose of this investigation is to study the observed nonlinear characteristic, and to assess the effectiveness of the ramped high-voltage dc test method in detecting and monitoring delaminated insulation.

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